



N650 SERIES THERMOSTATIC STEAM TRAPS

**Pressures To 650 PSIG (44.8 barg)
Temperatures to 750°F (400°C)**

Positive Shutoff — Valve and seats are lapped in matched sets, providing tight shutoff for light and no-load conditions which results in improved energy savings.

Freeze Proof — Self draining when installed vertically.

Compact-Easy to Install — Ample extension for pipe wrench provided.

Easily Maintained — Actuator element and valve are attached to cover to facilitate inspection and servicing. Optional stainless blowdown valve permits easy strainer cleaning while in service.

Directional Discharge — Pipe and thread erosion prevented by directing condensate to center of discharge pipe.

Hardened Stainless Steel Valve and Seat — Long life. Lapped as a matched set for water tight seal.

Temperature Sensitive Actuators — One moving part. Stainless Steel, fail open or fail closed, welded actuator for maximum corrosion, thermal and hydraulic shock resistance.

Positive Shutoff and Long Life — Integral Stainless Steel Strainer helps prevent debris from depositing onto valve and seat.

Strainer — Integral Stainless Steel Strainer standard on all models.

Guaranteed — Guaranteed against defects in materials or workmanship for 3 years.

MODELS*

- **N651-FO-Y** pattern body w/strainer and blowdown port tapped & plugged; low capacity, fail open
- **N652**—Reduced capacity
- **N653**—Standard capacity
- **N654**—High capacity

*Add (-FC) for fail closed or (-FO) for fail open to end of model number

APPLICATIONS

- Unit Heaters
- Air Vents
- Steam Tracing
- Drip Legs
- Platen Presses
- Plating Tanks
- Sterilizers
- Tire Presses
- Cooking Equipment
- Laundry Equipment
- Other Process Equipment

OPTIONS *See page 9*

- B - Blowdown Valve
- ISO - ISO Filled Actuator*
- SK - Skirted Seat*
- SLR - SLR Orifice
- SW - Socketweld

*Not available on N651

Canadian Registration # 0E0591.9

OPERATION

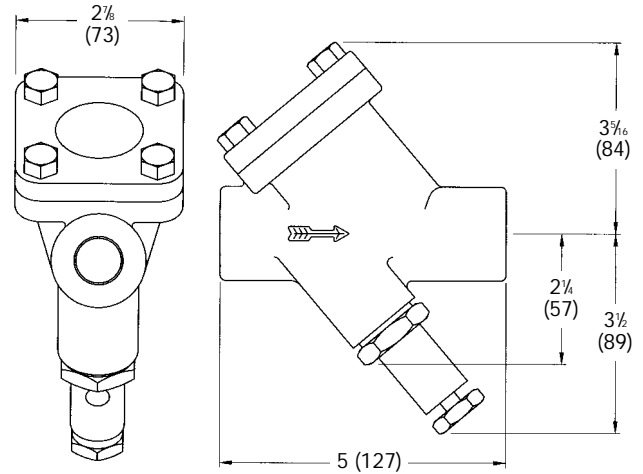
Thermal actuator is filled at its free length with a liquid having a lower boiling point than water. On start-up, valve is normally open. When steam enters trap, thermal actuator fill vaporizes to a pressure higher than line pressure. This forces valve into seat orifice to prevent any further flow. As condensate collects, it takes

heat from thermal actuator, lowering internal pressure. Line pressure will then compress thermal actuator to open valve and discharge condensate. Valve opening automatically adjusts to load conditions from minimum on very light loads to full lift at maximum load. Optional blowdown valve allows fast and easy cleaning of internal strainer without removing trap from operation.

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SPECIFICATION

Steam trap shall be of balanced pressure design with stainless steel welded actuator capable of discharging condensate within 10°F of saturated temperature. Where greater sensitivity is required or protection from flash steam locking, a SLR orifice will be available to allow condensate and flash steam evacuation at or near saturated temperatures. Where subcooling of condensate is desired alternate thermostatic actuator will be available to allow condensate evacuation at or near 40°F below saturated temperatures. Thermostatic actuator shall employ a conical valve lapped in matched sets with the seat ring assuring tight shut off. A minimum of four orifice sizes shall be available allowing for custom capacity sizing. Trap shall be forged carbon steel Y pattern body with strainer and available blow down valve suitable for pressures to 650 psig and available in 1/2" and 3/4" NPT or socketweld.



**SHOWN WITH OPTIONAL BLOWDOWN VALVE
WEIGHT: 5 LBS. (2.3 KG)**

**Connections:
1/2" or 3/4" NPT or socketweld**

MAXIMUM OPERATING CONDITIONS

Standard Traps

PMO: Max. Operating Pressure 500 psig (34.5 barg)

TMO: Max. Operating Temperature 600°F (316°C)

ISO Option Traps

PMO: Max. Operating Pressure 650 psig (44.8 barg)

TMO: Max. Operating Temperature 650°F (343°C)

All Traps

PMA: Max. Allowable Pressure 650 psig (44.8 barg)

TMA: Max. Allowable Temperature 750°F (400°C)

MATERIALS OF CONSTRUCTION

Body & CoverASTM A105 Forged Steel
 ActuatorWelded Stainless Steel
 Cover Gasket304 SS Spiral Wound w/Graphite Fill
 Strainer033 Perf. 304 Stainless Steel
 Blowdown Valve416 Stainless Steel
 Valve & SeatHardened 416 Stainless Steel

Maximum Capacity—lbs/hr 10°F Below Saturation (Kg/hr 5°C Below Saturation)

Trap	Orifice Inch (mm)	Differential PSIG (barg)																
		5 (0.34)	10 (0.7)	20 (1.4)	50 (3.5)	100 (6.9)	125 (8.62)	150 (10.3)	200 (13.8)	250 (17.2)	300 (20.7)	350 (24.1)	400 (27.6)	450 (31.0)	500 (34.5)	550 (37.9)	600 (41.4)	650 (44.8)
N651	5/64 (2)	84 (38)	119 (54)	168 (76)	265 (120)	348 (158)	375 (170)	398 (181)	439 (199)	472 (214)	502 (228)	529 (240)	553 (251)	575 (261)	595 (270)	615 (280)	635 (289)	650 (295)
N652	1/8 (3)	216 (98)	265 (120)	375 (170)	592 (269)	778 (354)	838 (381)	890 (405)	980 (445)	1055 (480)	1121 (510)	1180 (536)	1235 (561)	1284 (584)	1331 (604)	1377 (625)	1425 (646)	1471 (667)
N653	1/4 (6)	550 (249)	825 (374)	1210 (549)	1975 (896)	2825 (1281)	3140 (1424)	3425 (1554)	3650 (1656)	3960 (1796)	4100 (1860)	4230 (1919)	4420 (2005)	4600 (2086)	4760 (2161)	4910 (2232)	5060 (2297)	5190 (2359)
N654	5/16 (8)	860 (390)	1220 (554)	1725 (783)	2725 (1237)	3575 (1623)	3850 (1748)	4090 (1857)	4505 (2045)	4850 (2202)	5155 (2340)	5425 (2463)	5675 (2576)	5900 (2679)	6110 (2774)	6310 (2868)	6480 (2945)	6625 (3011)

Nicholson recommends ISO filled Actuator above 500 psi (34.5 bar) and for superheated steam.
 Nicholson recommends skirted seat above 300 psi (20.7 bar).